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FIG. 1A

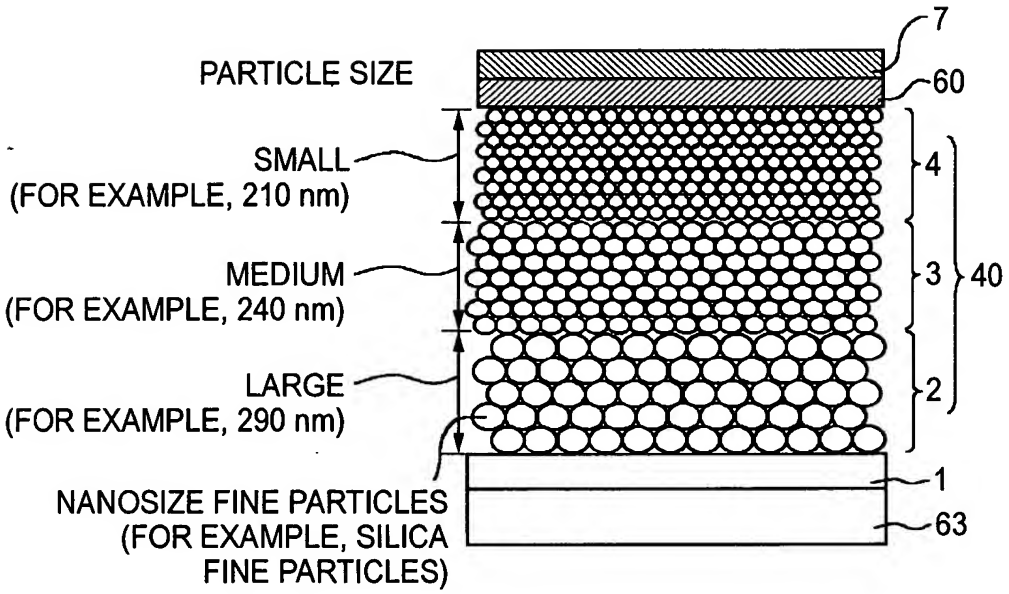

PARTICLE SIZE
SMALL
(FOR EXAMPLE, 210 nm)
MEDIUM
(FOR EXAMPLE, 240 nm)
LARGE
(FOR EXAMPLE, 290 nm)
NANOSIZE FINE PARTICLES
(FOR EXAMPLE, SILICA
FINE PARTICLES)
7
60
4
3
40
2
1
63

FIG. 1B

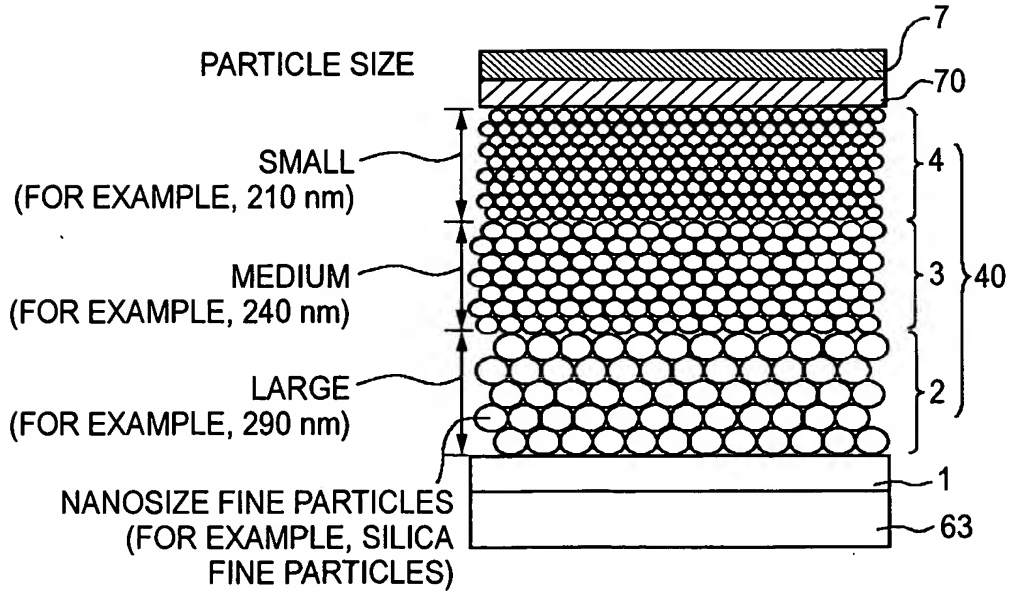

PARTICLE SIZE
SMALL
(FOR EXAMPLE, 210 nm)
MEDIUM
(FOR EXAMPLE, 240 nm)
LARGE
(FOR EXAMPLE, 290 nm)
NANOSIZE FINE PARTICLES
(FOR EXAMPLE, SILICA
FINE PARTICLES)
7
70
4
3
40
2
1
63

FIG. 2A

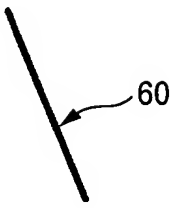


FIG. 2B

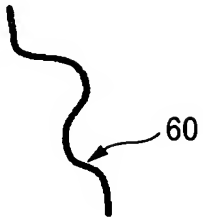


FIG. 2C

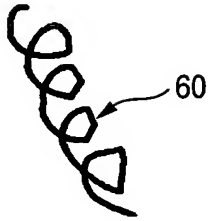


FIG. 3

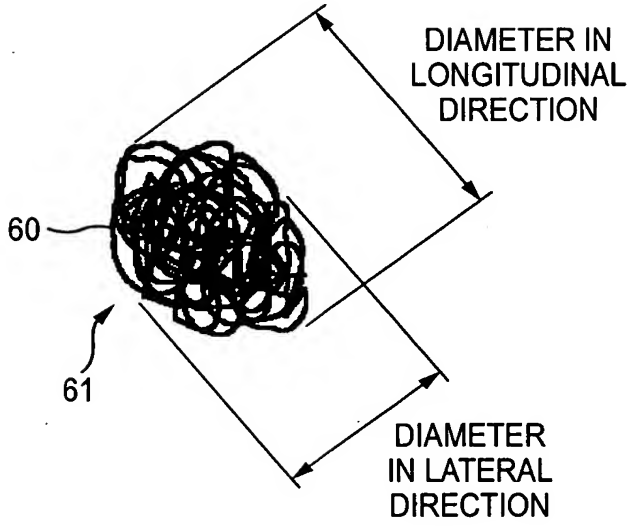


FIG. 4A

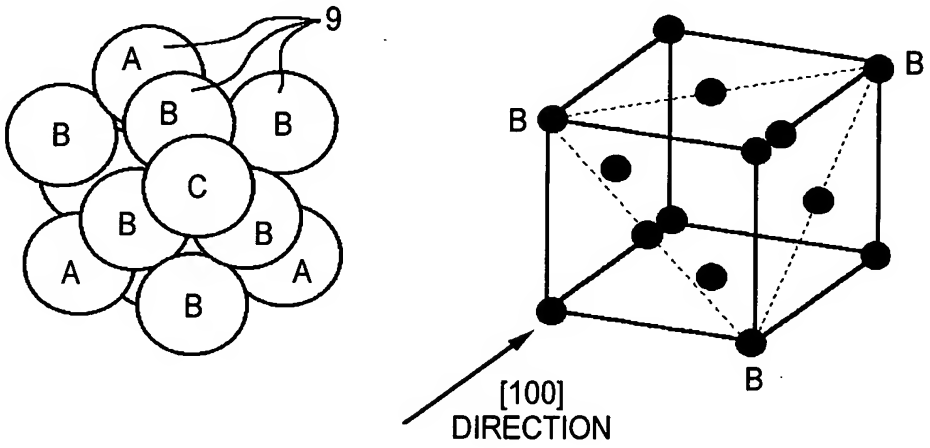


FIG. 4B

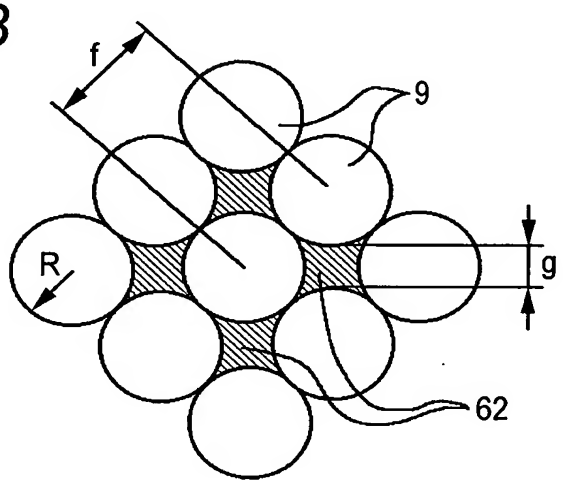


FIG. 5

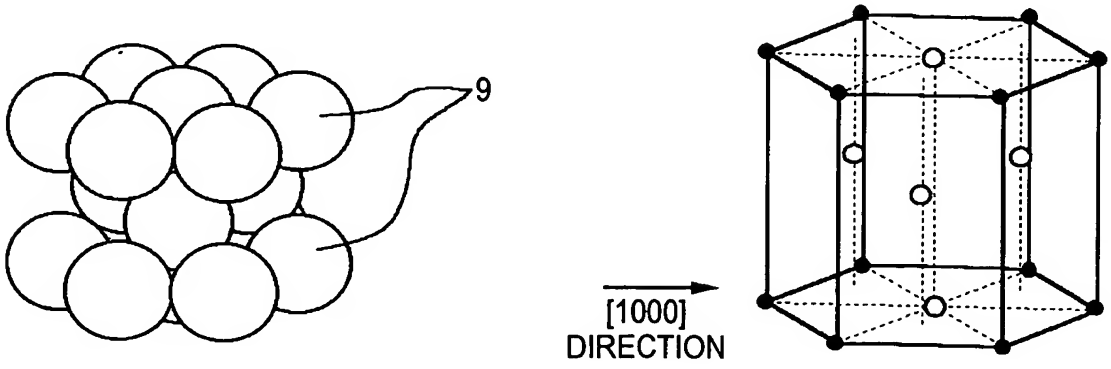


FIG. 6

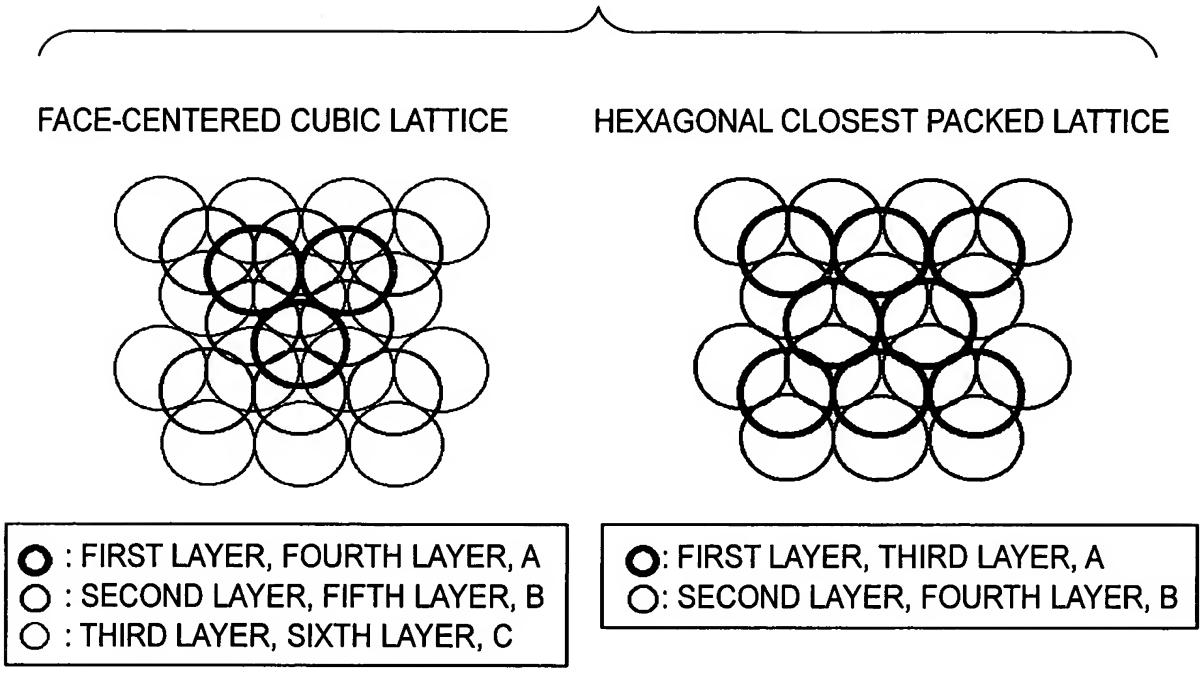

FACE-CENTERED CUBIC LATTICE
HEXAGONAL CLOSEST PACKED LATTICE
: FIRST LAYER, FOURTH LAYER, A
: SECOND LAYER, FIFTH LAYER, B
: THIRD LAYER, SIXTH LAYER, C
: FIRST LAYER, THIRD LAYER, A
: SECOND LAYER, FOURTH LAYER, B

FIG. 7

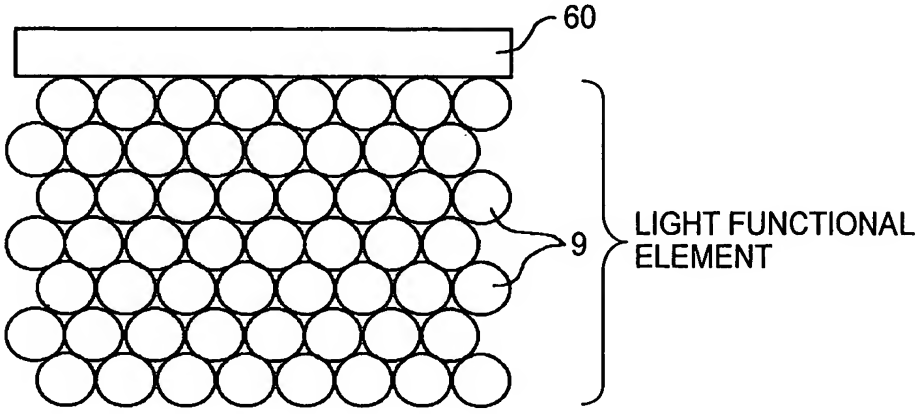

60
9
LIGHT FUNCTIONAL ELEMENT

FIG. 8A

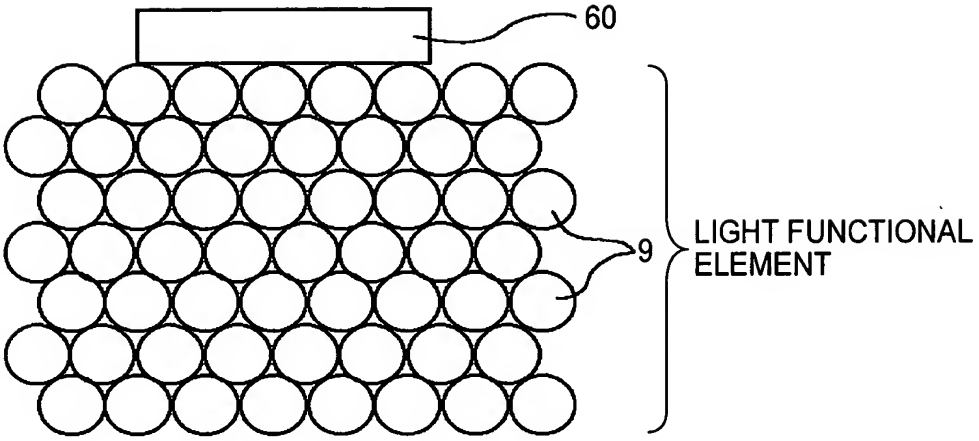


FIG. 8B

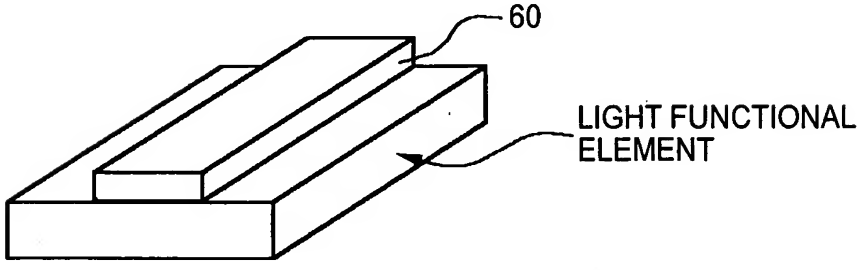


FIG. 9

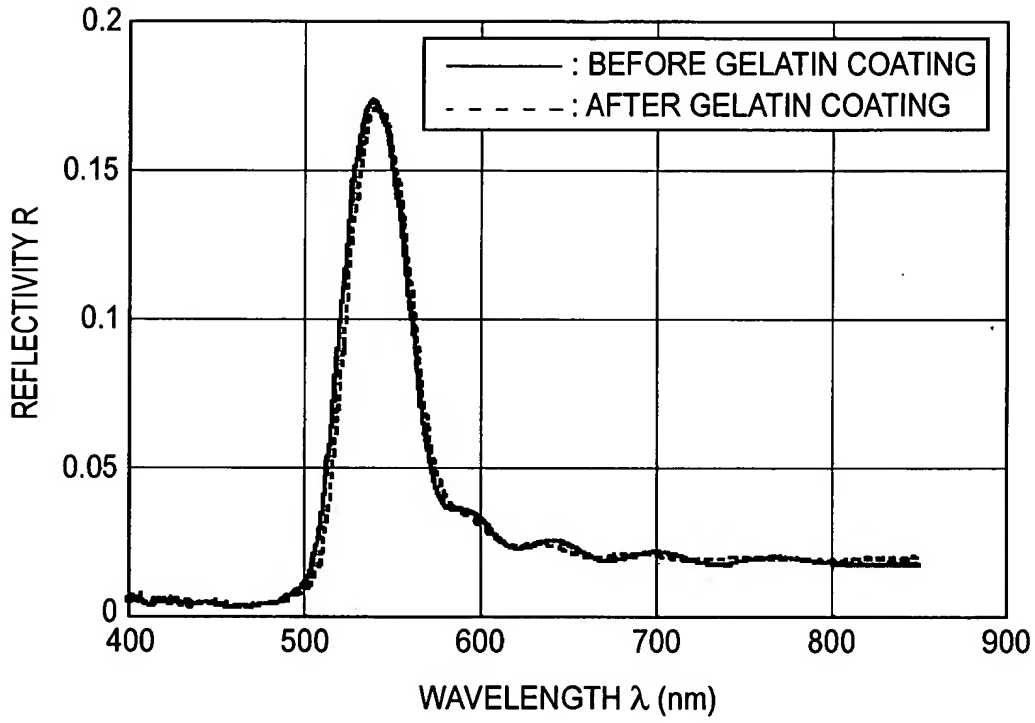

0.2
0.15
0.1
0.05
0
REFLECTIVITY R
400
500
600
700
800
900
WAVELENGTH λ (nm)
: BEFORE GELATIN COATING
: AFTER GELATIN COATING

FIG. 10

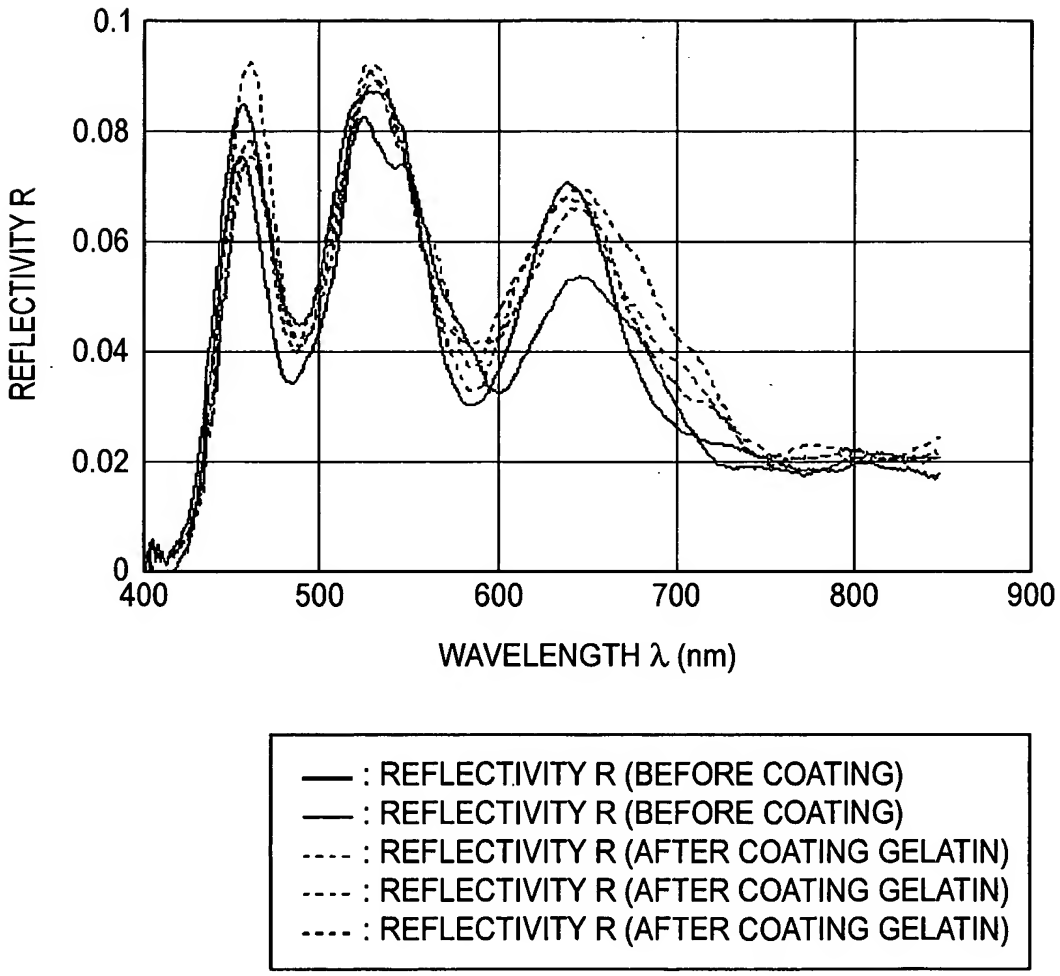

0.1
0.08
0.06
0.04
0.02
0
REFLECTIVITY R
400
500
600
700
800
900
WAVELENGTH λ (nm)
—— : REFLECTIVITY R (BEFORE COATING)
—— : REFLECTIVITY R (BEFORE COATING)
---- : REFLECTIVITY R (AFTER COATING GELATIN)
---- : REFLECTIVITY R (AFTER COATING GELATIN)
---- : REFLECTIVITY R (AFTER COATING GELATIN)

FIG. 11

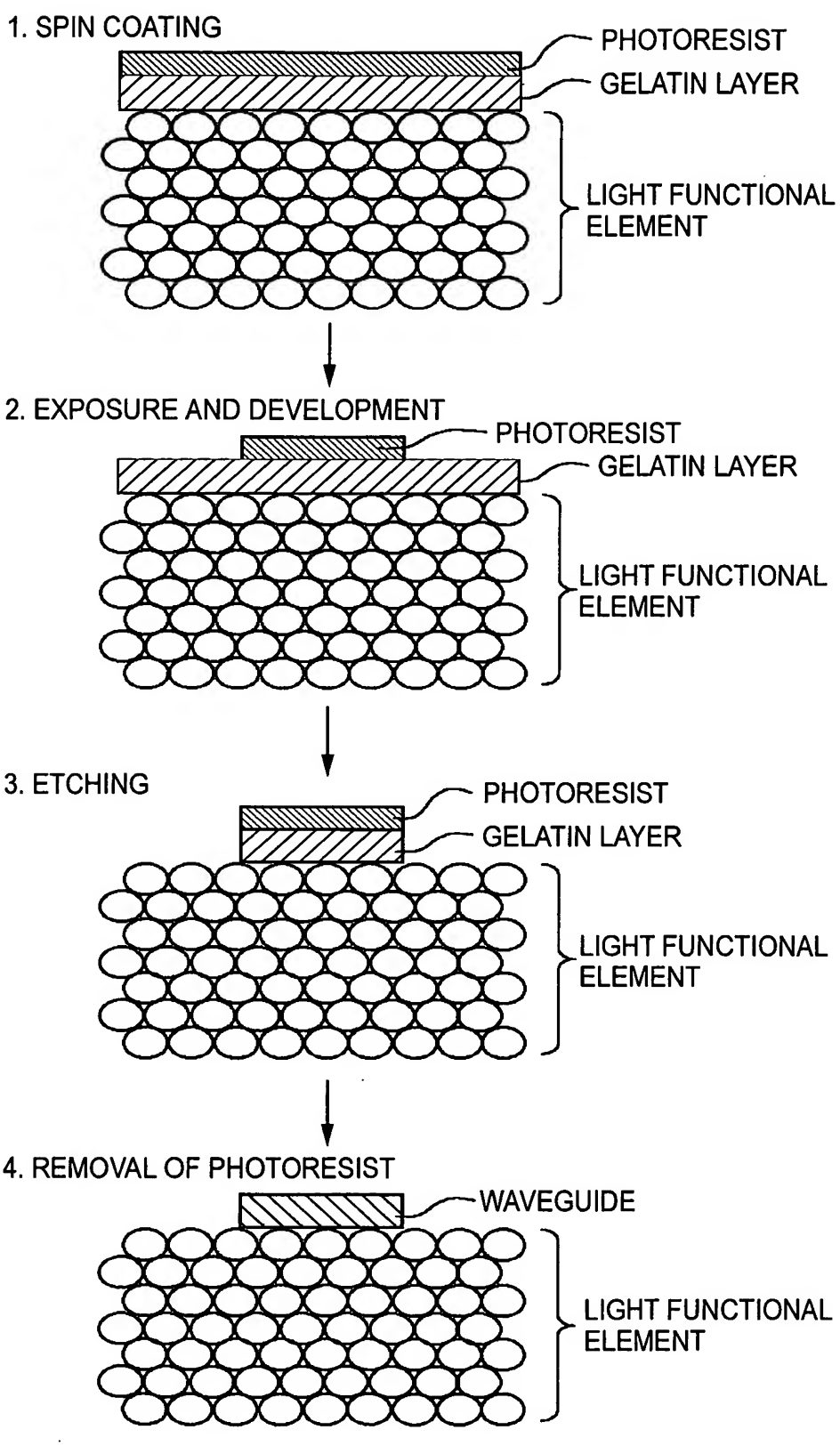

1. SPIN COATING
PHOTORESIST
GELATIN LAYER
LIGHT FUNCTIONAL ELEMENT
2. EXPOSURE AND DEVELOPMENT
PHOTORESIST
GELATIN LAYER
LIGHT FUNCTIONAL ELEMENT
3. ETCHING
PHOTORESIST
GELATIN LAYER
LIGHT FUNCTIONAL ELEMENT
4. REMOVAL OF PHOTORESIST
WAVEGUIDE
LIGHT FUNCTIONAL ELEMENT

FIG. 12

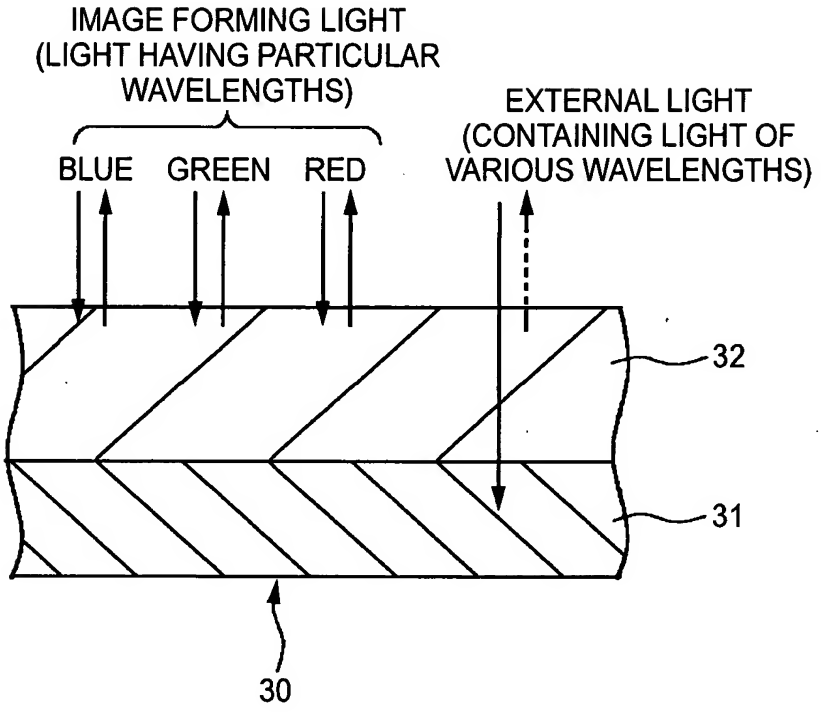


IMAGE FORMING LIGHT
(LIGHT HAVING PARTICULAR
WAVELENGTHS)
BLUE
GREEN
RED
EXTERNAL LIGHT
(CONTAINING LIGHT OF
VARIOUS WAVELENGTHS)
32
31
30

FIG. 13A

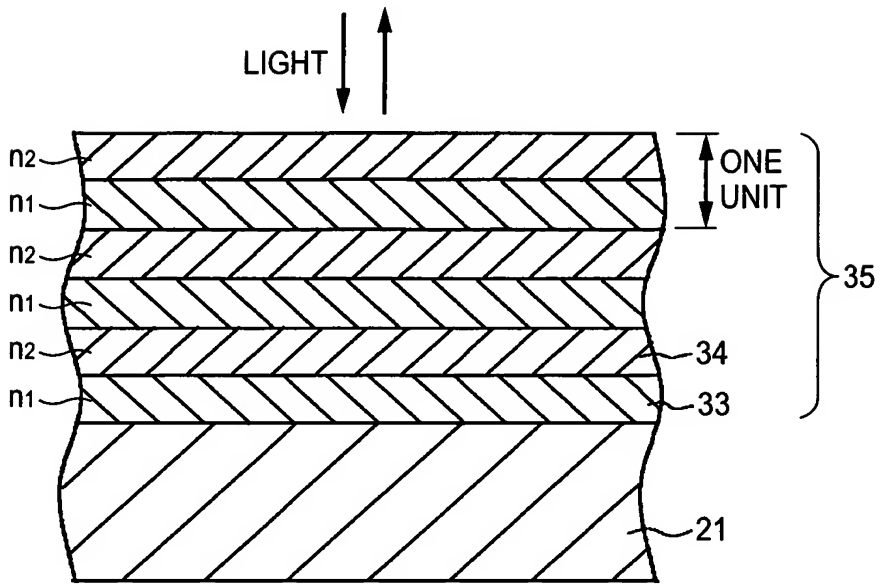


FIG. 13B

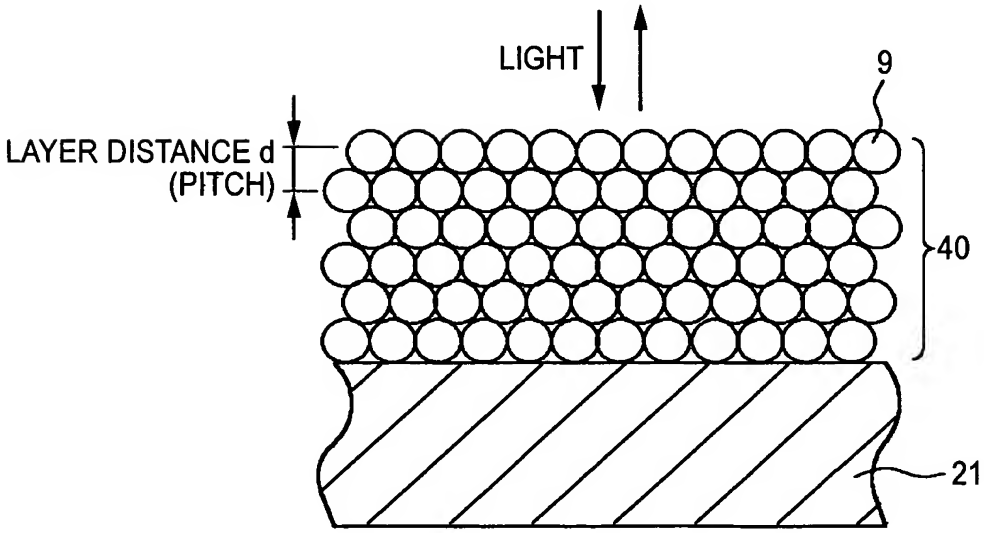
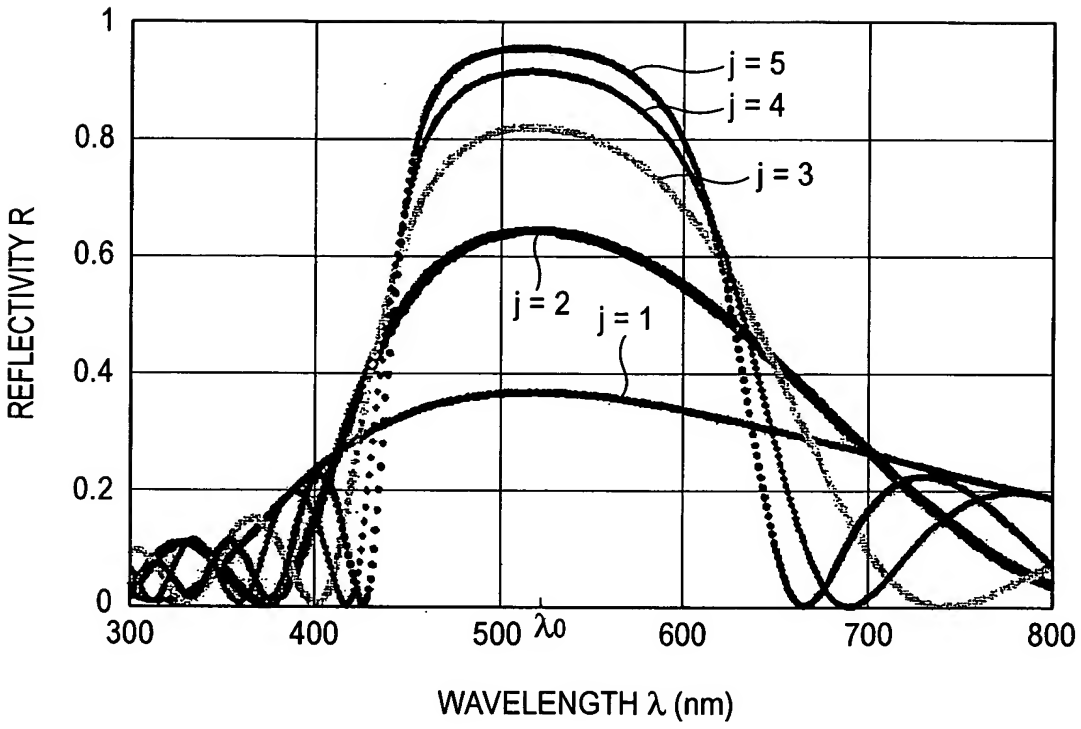


FIG. 14



PEAK OF REFLECTIVITY AT λ_0 = 520nm,
j INDICATING NUMBER OF ACCUMULATION

FIG. 15

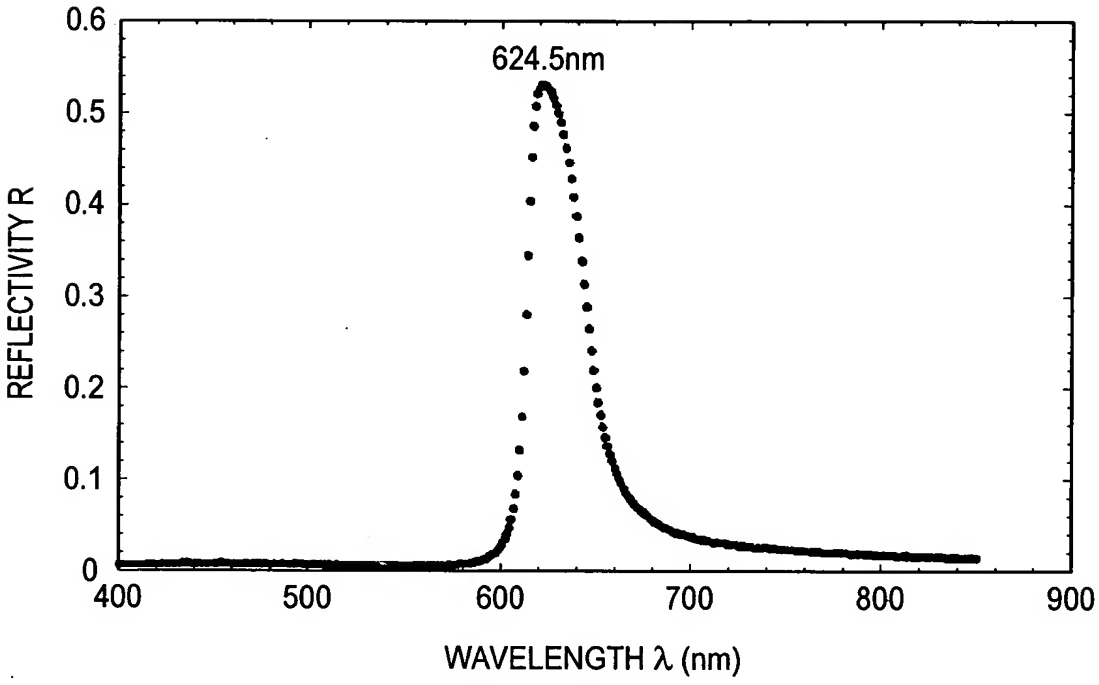

624.5nm
REFLECTIVITY R
0.6
0.5
0.4
0.3
0.2
0.1
0
400
500
600
700
800
900
WAVELENGTH λ (nm)

FIG. 16A

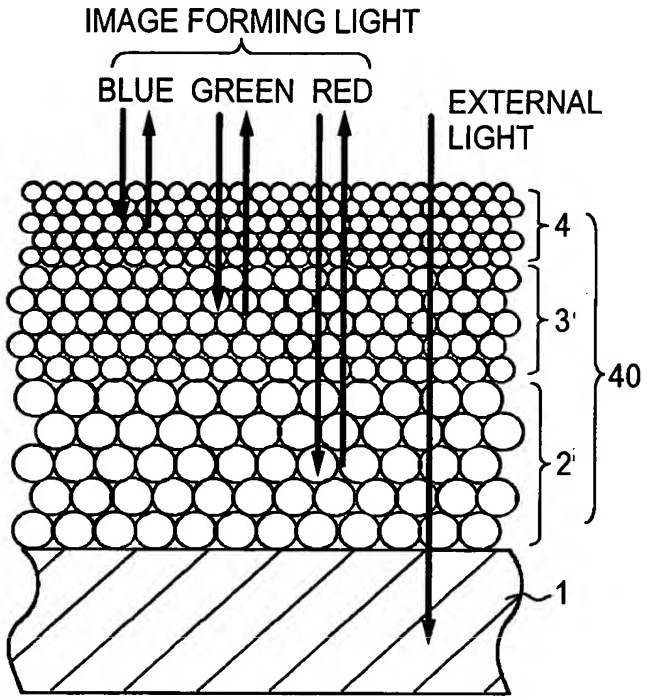


FIG. 16B

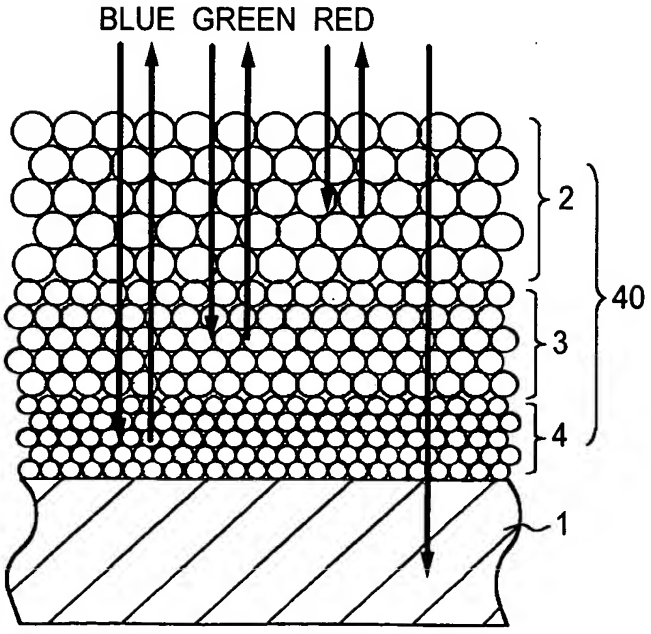
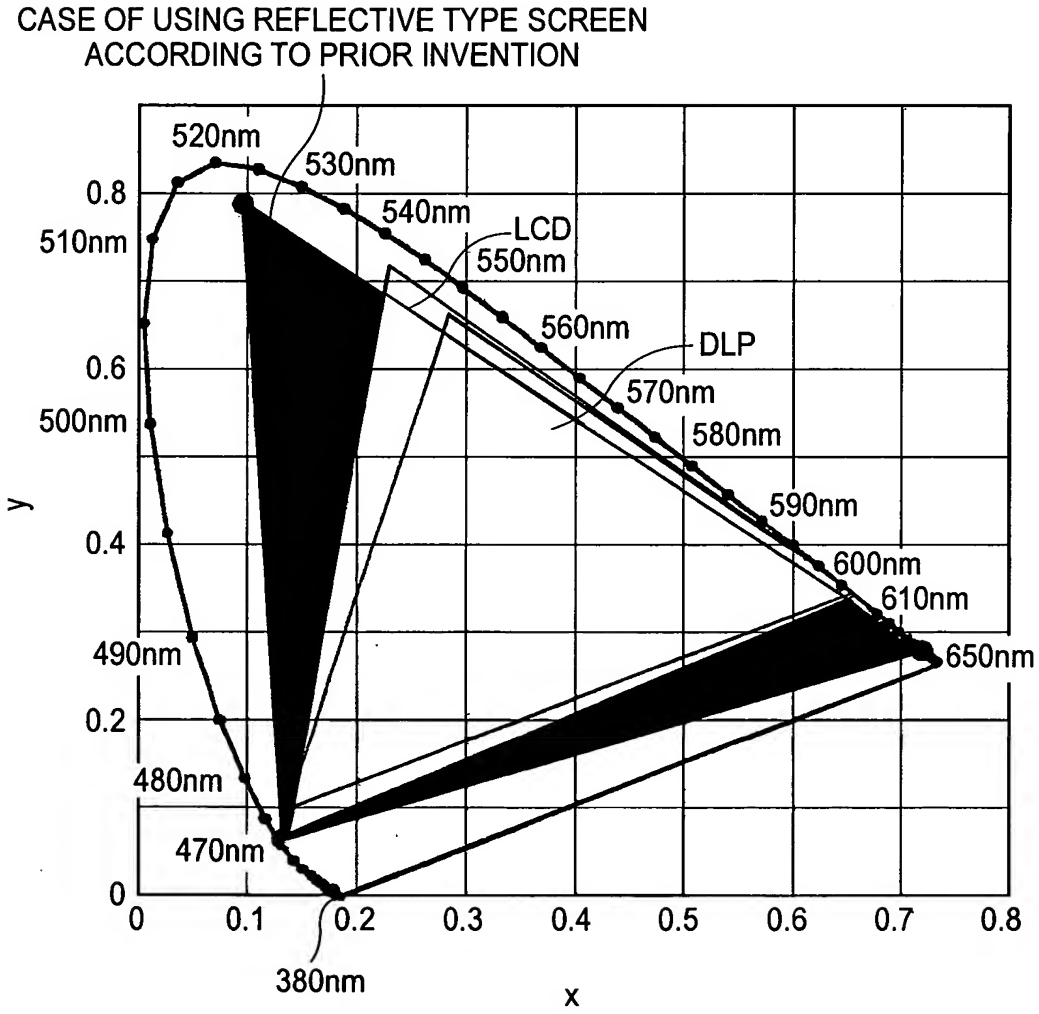


FIG. 17


CASE OF USING REFLECTIVE TYPE SCREEN
ACCORDING TO PRIOR INVENTION
520nm
530nm
540nm
LCD
550nm
560nm
DLP
570nm
580nm
590nm
600nm
610nm
650nm
510nm
500nm
490nm
480nm
470nm
380nm
0.8
0.6
0.4
0.2
0
y
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
x

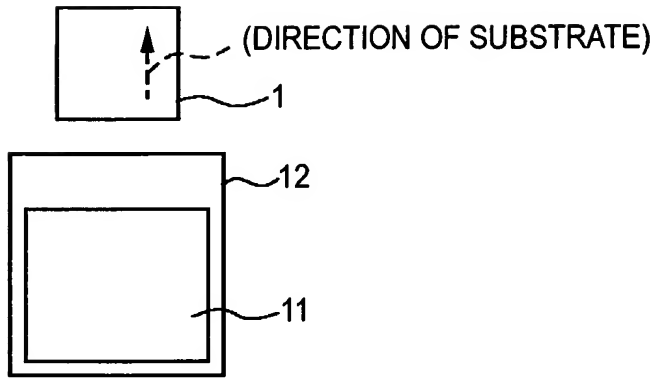


FIG. 18A

SETTING DIRECTION OF SUBSTRATE

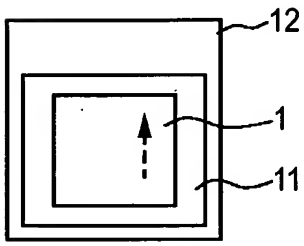


FIG. 18B

DIPPING SUBSTRATE IN FINE PARTICLE DISPERSION

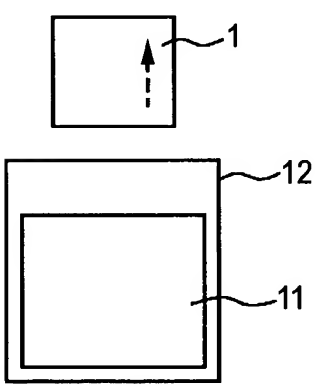


FIG. 18C

DRAWING UP SUBSTRATE

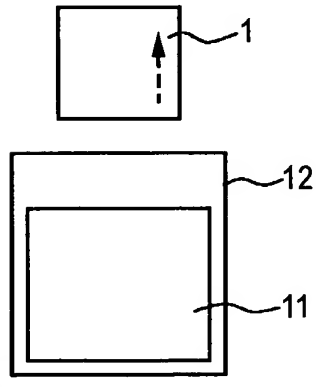
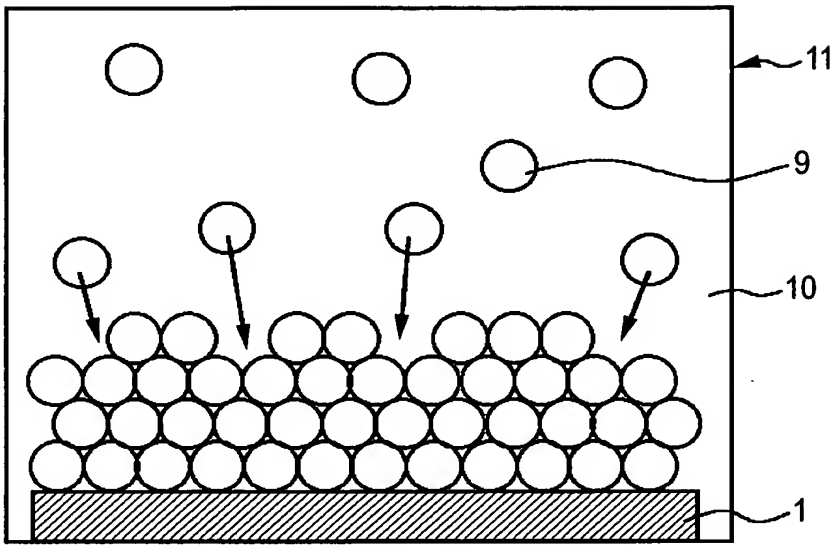


FIG. 18D

DRYING SUBSTRATE

FIG. 19



FINE PARTICLES ARE ARRANGED IN SELF-ORGANIZATION BY GRADUALLY ACCUMULATING FINE PARTICLES FROM FINE PARTICLE DISPERSION

FIG. 20

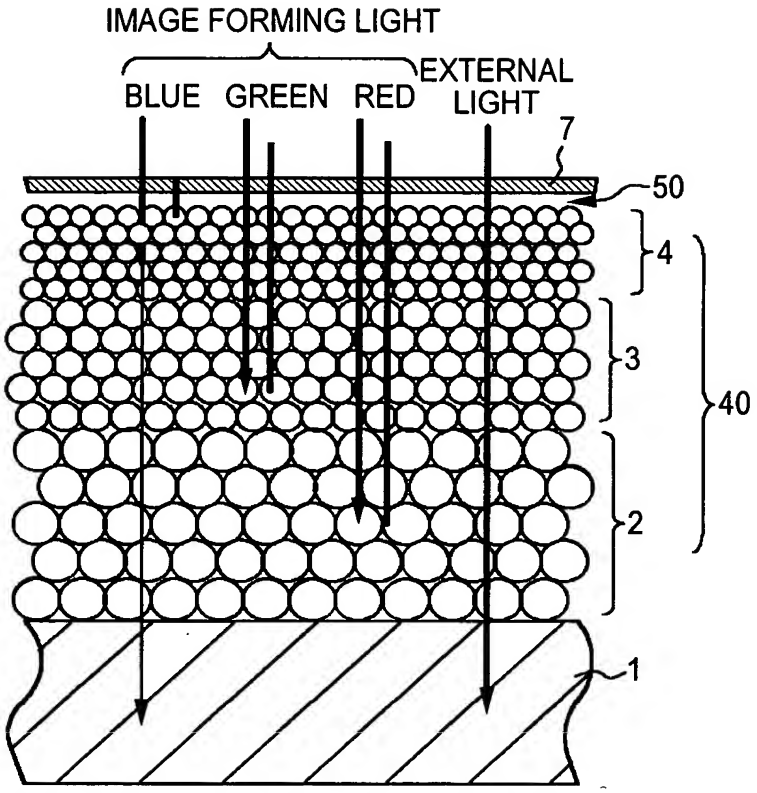


IMAGE FORMING LIGHT
BLUE
GREEN
RED
EXTERNAL LIGHT
7
50
4
3
40
2
1

FIG. 21

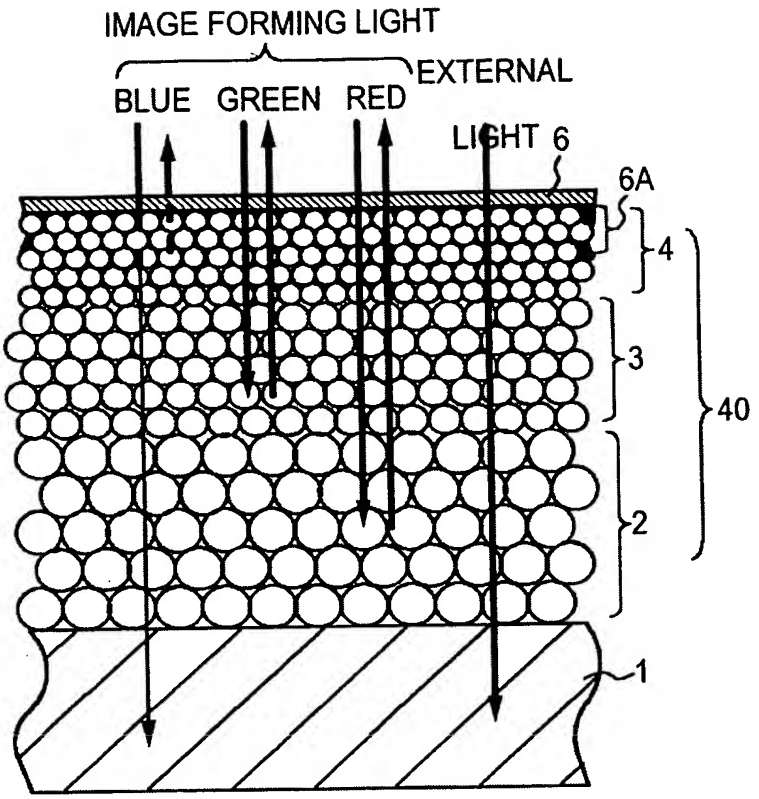
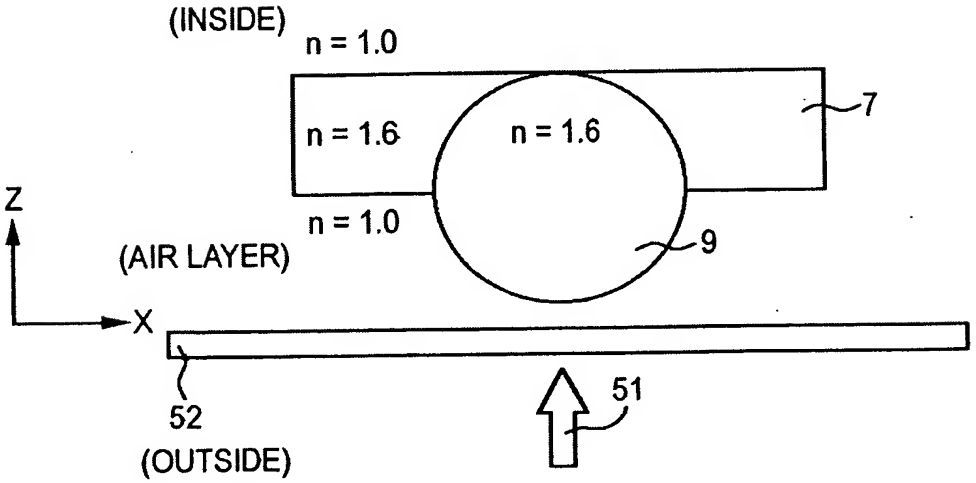


IMAGE FORMING LIGHT
EXTERNAL
BLUE
GREEN
RED
LIGHT 6
6A
4
3
40
2
1

FIG. 22


(INSIDE)
n = 1.0
n = 1.6
n = 1.6
7
n = 1.0
9
Z
(AIR LAYER)
X
52
(OUTSIDE)
51

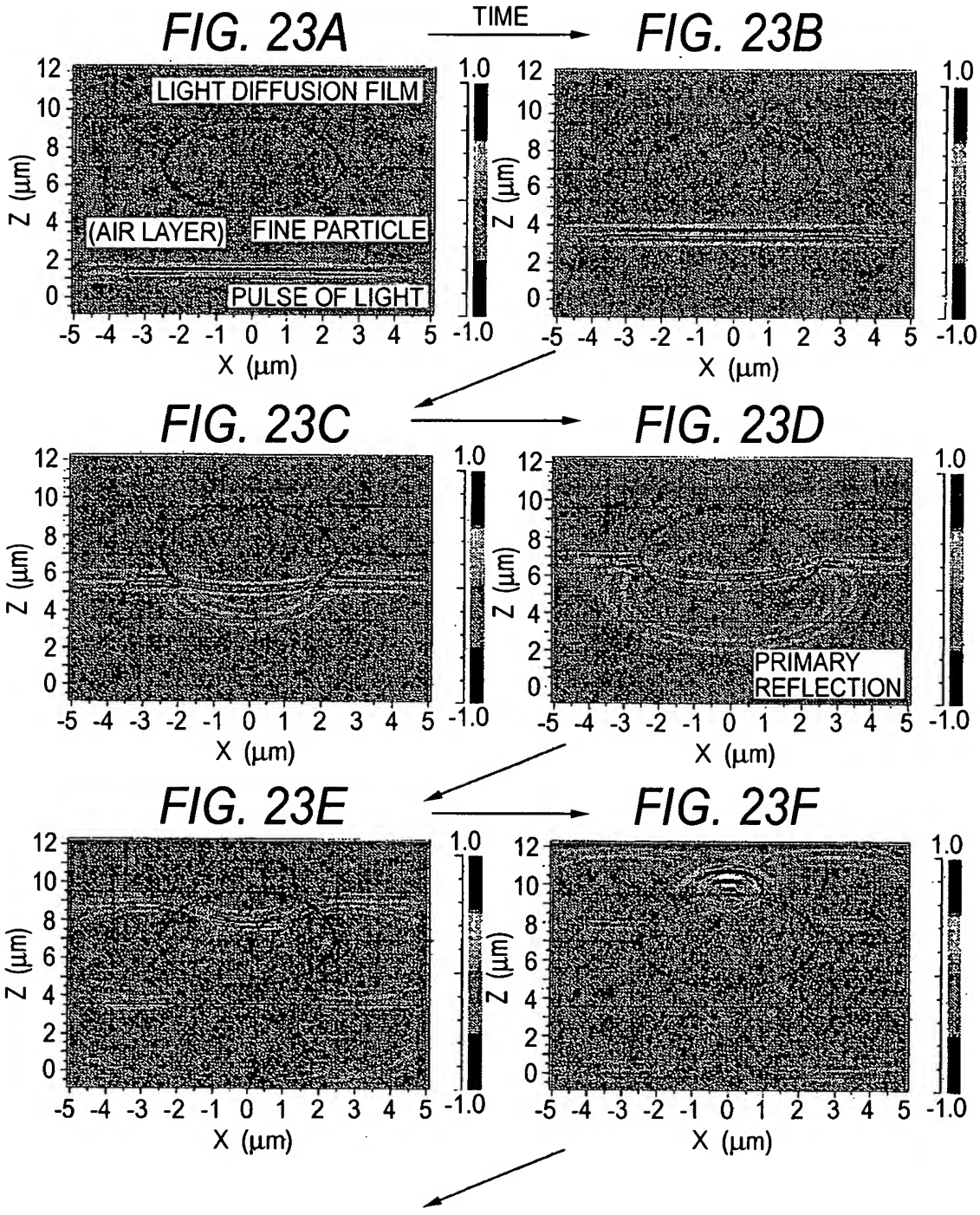


FIG. 23A
TIME
FIG. 23B
LIGHT DIFFUSION FILM
(AIR LAYER)
FINE PARTICLE
PULSE OF LIGHT
Z (μm)
X (μm)
1.0
-1.0
FIG. 23C
FIG. 23D
PRIMARY REFLECTION
FIG. 23E
FIG. 23F

FIG. 24G

TIME

FIG. 24H

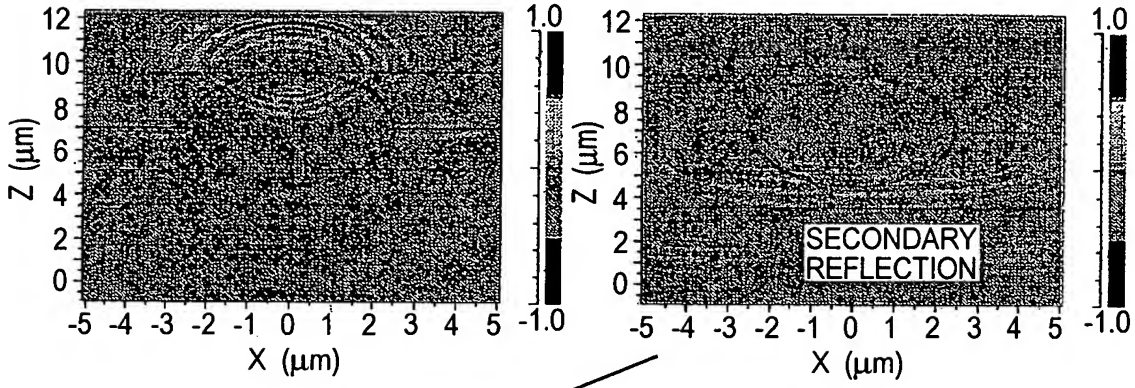


FIG. 24I

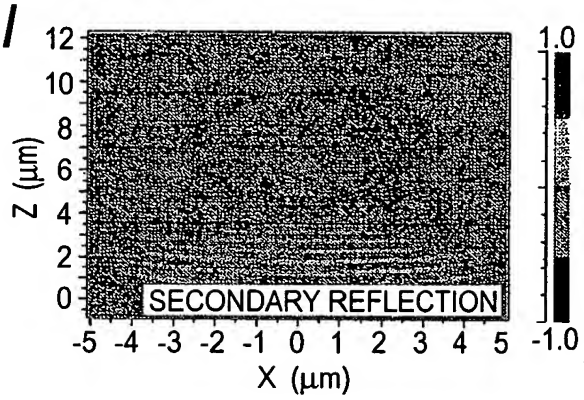


FIG. 25

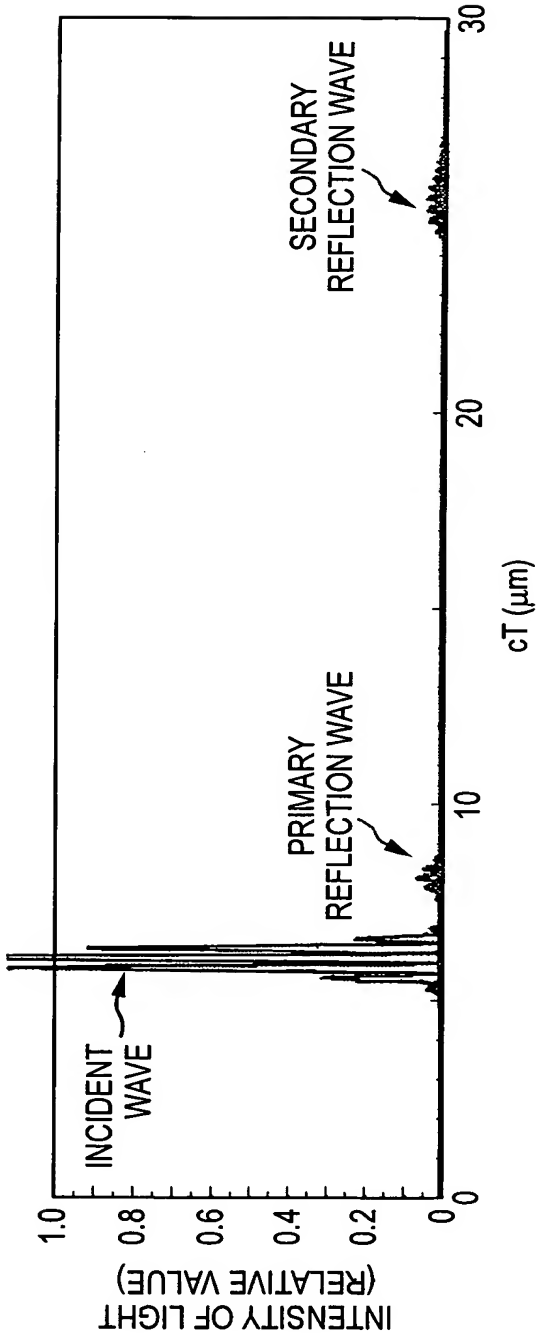

INTENSITY OF LIGHT
(RELATIVE VALUE)
1.0
0.8
0.6
0.4
0.2
0
0
10
20
30
cT (μm)
INCIDENT WAVE
PRIMARY REFLECTION WAVE
SECONDARY REFLECTION WAVE

FIG. 26

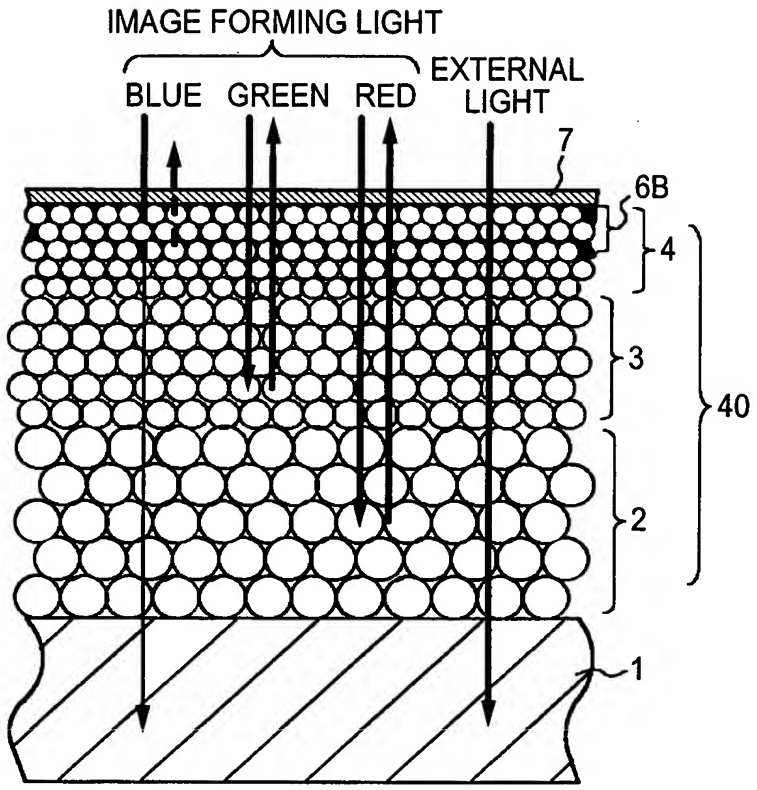


IMAGE FORMING LIGHT
BLUE
GREEN
RED
EXTERNAL LIGHT
7
6B
4
3
2
1
40